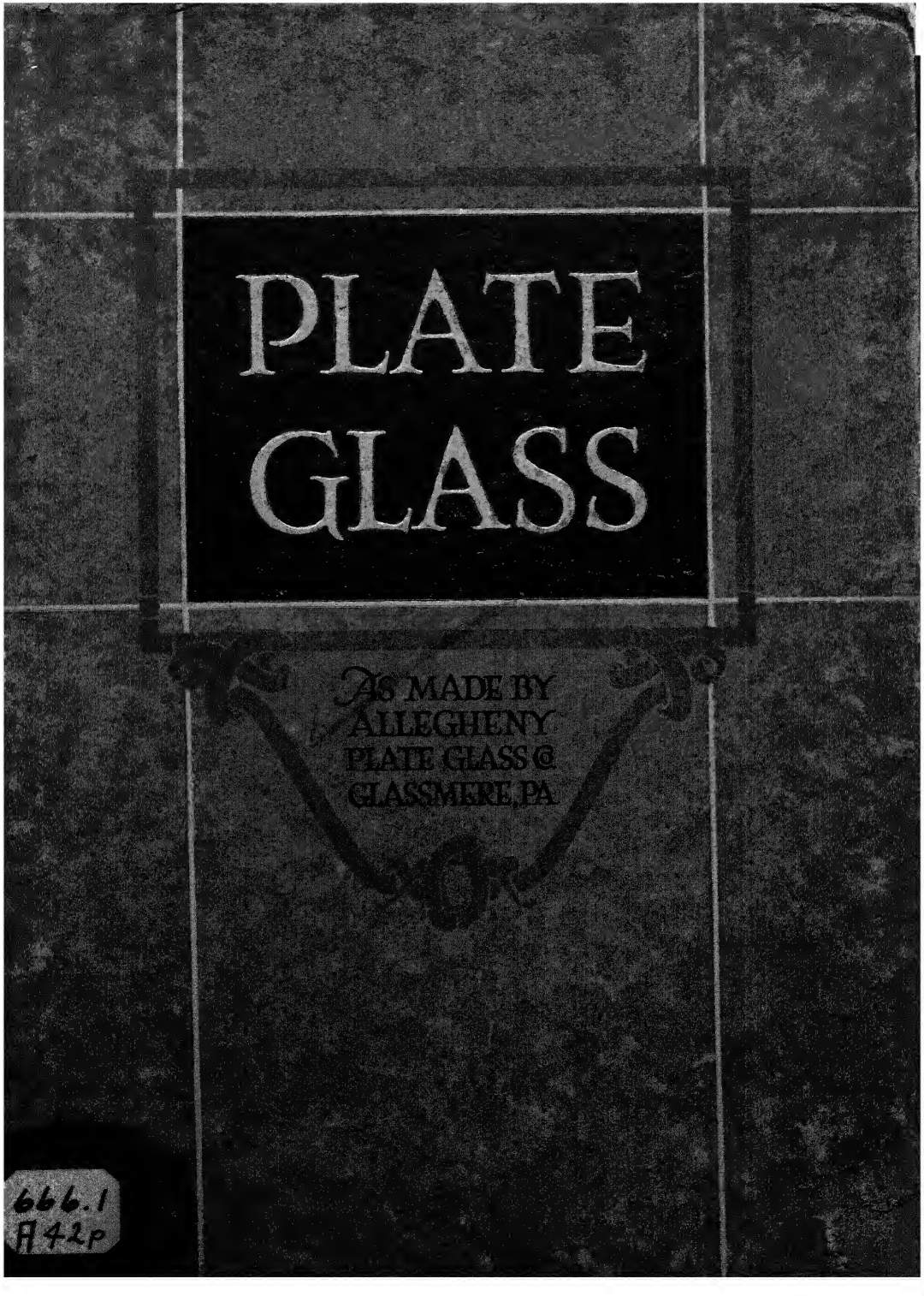
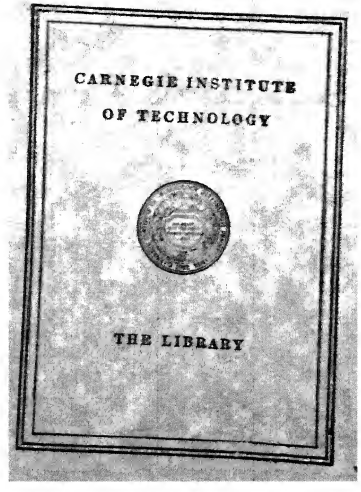


PLATE
GLASS
AS MADE BY
ALLEGHENY
PLATE GLASS CO
GLASSMERE, PA.



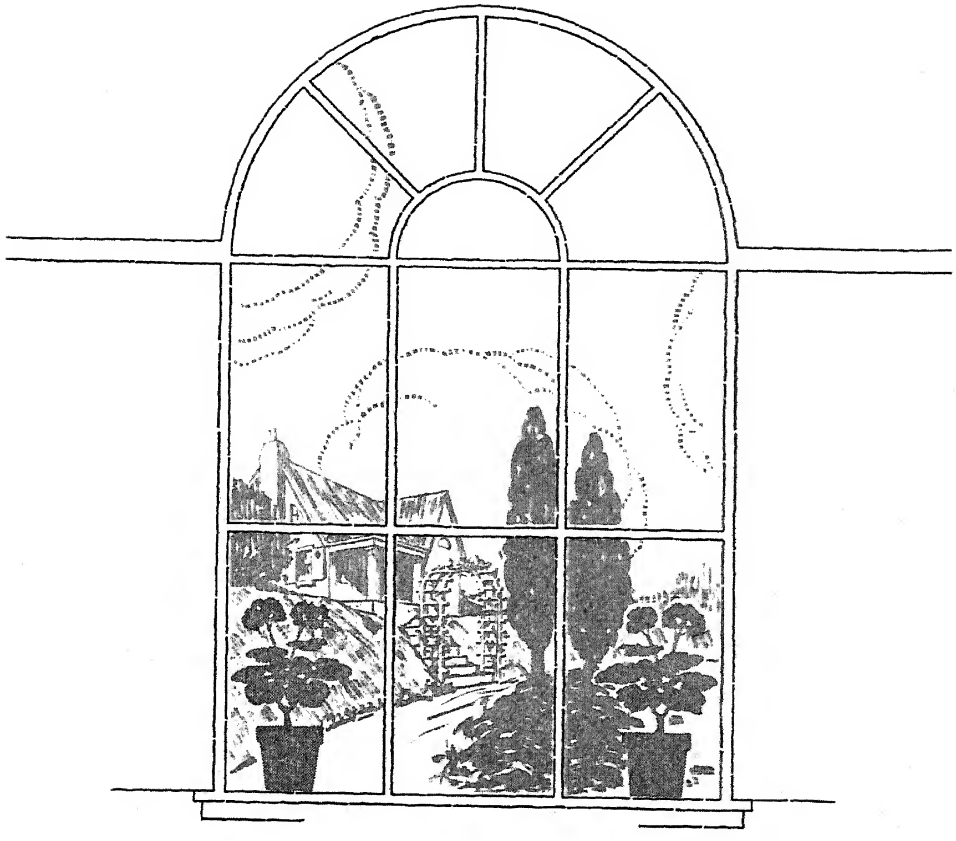


PLATE GLASS

As Made by
Allegheny Plate Glass Co.
Glassmere, Pa.

A QUALITY PRODUCT

ALLEGHENY PLATE GLASS COMPANY

GLASSMERE · PENNSYLVANIA · USA

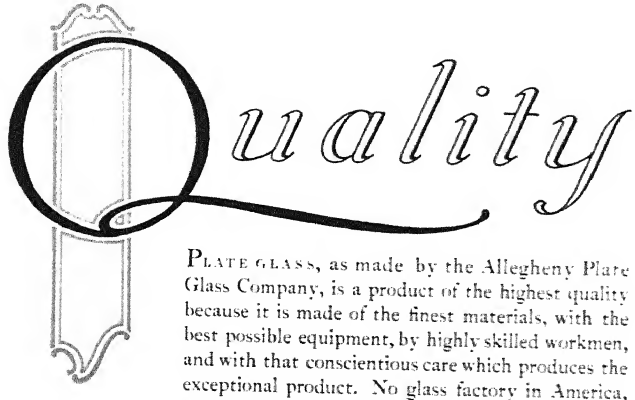
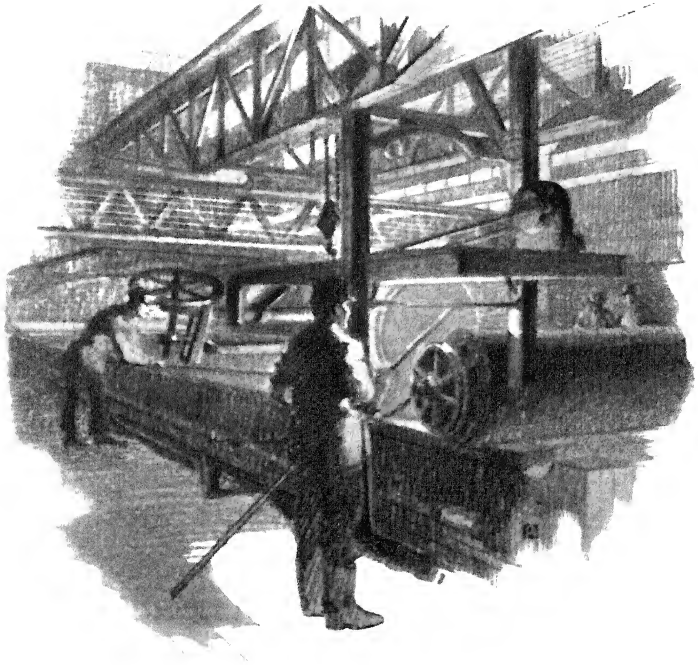


PLATE GLASS, as made by the Allegheny Plate Glass Company, is a product of the highest quality because it is made of the finest materials, with the best possible equipment, by highly skilled workmen, and with that conscientious care which produces the exceptional product. No glass factory in America, or in the world, can match the complete electrical machinery with which our plant is equipped, and few indeed can equal the organized care and skill which is here put into the manufacturing process. A big, bright, model factory, with careful provision for the health and well-being of its thousand workers, is only a part of our resources; a persistent purpose to produce the best that can possibly be made in the most efficient and practical manner is another part even more important.

SAID EMERSON, "If you write a better book or preach a better sermon or build a better mouse-trap than your neighbor, though you build your house in the wilderness the world will make a beaten path to your door."

A broad, hard-beaten pathway leads to Glassmere, Pennsylvania, on the banks of the Allegheny

ALLEGHENY PLATE GLASS COMPANY



ALLEGHENY PLATE GLASS COMPANY

The Management

ALLEGHENY PLATE GLASS COMPANY

THE *Allegheny Plate Glass Company* takes pleasure in presenting this book to its friends, hoping it will serve a useful purpose as a permanent record of past development and of present attainments in the exacting business of making good plate.

In its pages will be evidenced the fact that here one of the world's oldest industries keeps pace with progress and faith with quality.

GLASSMERE · PENNSYLVANIA · USA

C. D. KELLER
Sales Manager

D. K. ALBRIGHT
General Manager

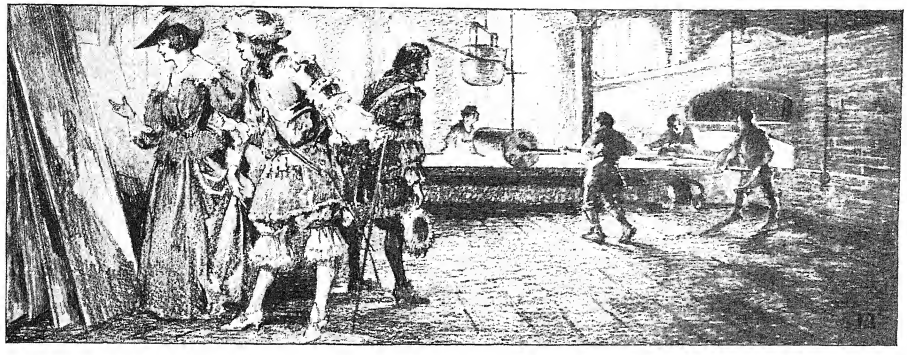
Officers

A. E. BRAUN . . . . *President*
GEORGE H. CLAPP . . *Vice President*
MALCOLM MCGIFFIN . *Secretary-Treasurer*
GEORGE C. MOORE, *Assistant Secretary-Treasurer*
W. G. RENSHAW . . . . *Auditor*

Directors

GEORGE H. CLAPP — WM. C. KING
O. C. CAMP — MALCOLM MCGIFFIN
A. E. BRAUN

GLASSMERE · PENNSYLVANIA · USA



PERHAPS the most ancient record of the making of glass is found on Egyptian tombs of the fourth and fifth dynasty, 4000 B.C., carved figures representing glass blowers at work. Up to the Roman era Alexandria was the glass making center of the world, though Tyre and Sidon, in Phoenicia, greatly developed the art.

As a civilization decayed, trade secrets shifted with the changing cultural centers and we find the industry prospering successively in Rome, Byzantium, and through the Middle Ages, in Venice, where the decorative and artistic qualities of glass were greatly enhanced by closely guarded coloring methods.

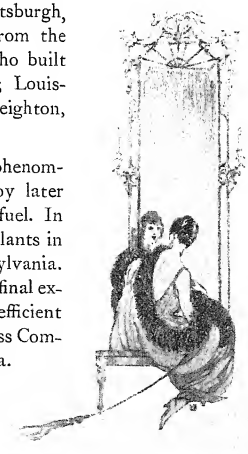
In the year 1503, authority was given by "The Council of Ten" to Andrea and Dominice Dansola del Galle to establish in Murano Island, one of the islands of Venice, a factory for the manufacture of crystalline mirrors and the workmen employed at this factory were forbidden to work at any other place under penalty of death.

In 1664, the great Colbert charged Bonzi, Bishop of Bezier, French Ambassador to Venice, to recruit workmen for a factory for the purpose of making mirrors in France. This factory was installed in Paris, Faubourg St. Antione, in 1665.

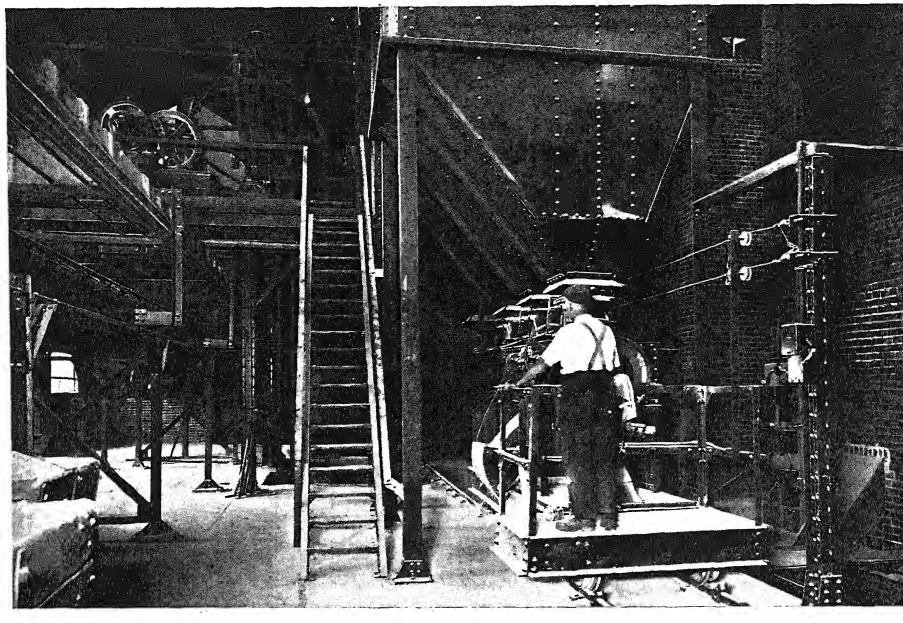
In 1688, Abraham Thevart also obtained permission to make mirrors. A second factory was established in Paris, and in 1693 Louis Lucas de Nehou invented the casting of plate glass on a flat bed. In the same year the factory was moved to the St. Gobain Castle, the only source of cast plate for a century.

Rough plate was first made in America in 1852, at Williamsburg, L. I., by Cuthbert Dixon, an Englishman. At Cheshire and Lenox Furnace, Mass., window glass factories were converted to the production of plate. The Lenox factory was visited in 1869, by James B. Ford of Pittsburgh, who learned what he could from the foreign workmen there, and who built factories at New Albany, Ind.; Louisville, Ky.; Jeffersonville, Ind.; Creighton, Pa., and Tarentum, Pa.

The industry soon took on a phenomenal development, augmented by later substitution of natural gas for fuel. In 1917, nine of the fifteen plate plants in the United States were in Pennsylvania. Now, plate glass history finds its final expression in the most modern and efficient plant of the Allegheny Plate Glass Company, at Glassmere, Pennsylvania.

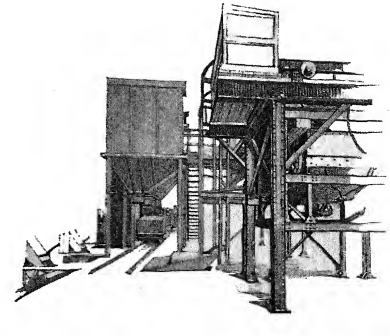


ALLEGHENY PLATE GLASS COMPANY

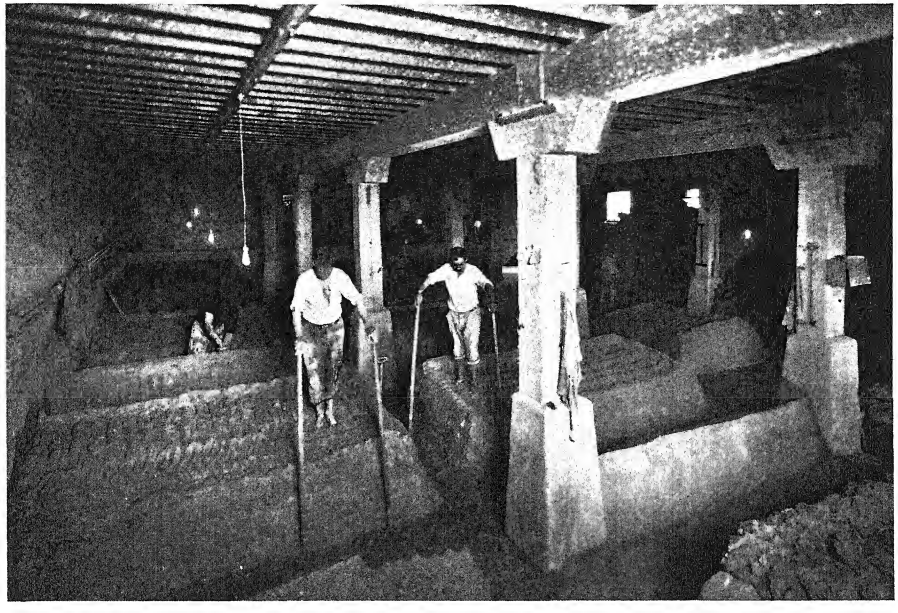


SCRUPULOUS supervision, supplemented by all the precaution that mechanical ingenuity can offer, characterizes the selection and handling of the raw materials, and their preparation for the furnace. Typical of this vigilance, the ingredients pass over magnetized pulleys before entering the bins, removing any stray nails or metal which may have accidently entered. Regular analyses by qualified chemists serve as a further check.

PROPORTIONS by weight are mechanically measured at the bin outlets, insuring absolute uniformity. Then the operator runs the car a short distance and dumps the contents on a conveyor which feeds the mixer shown at the upper level, left. There the batch is mixed and discharged by gravity into traveling cars suspended beneath. These run to the furnace room and are met by the charging crane.



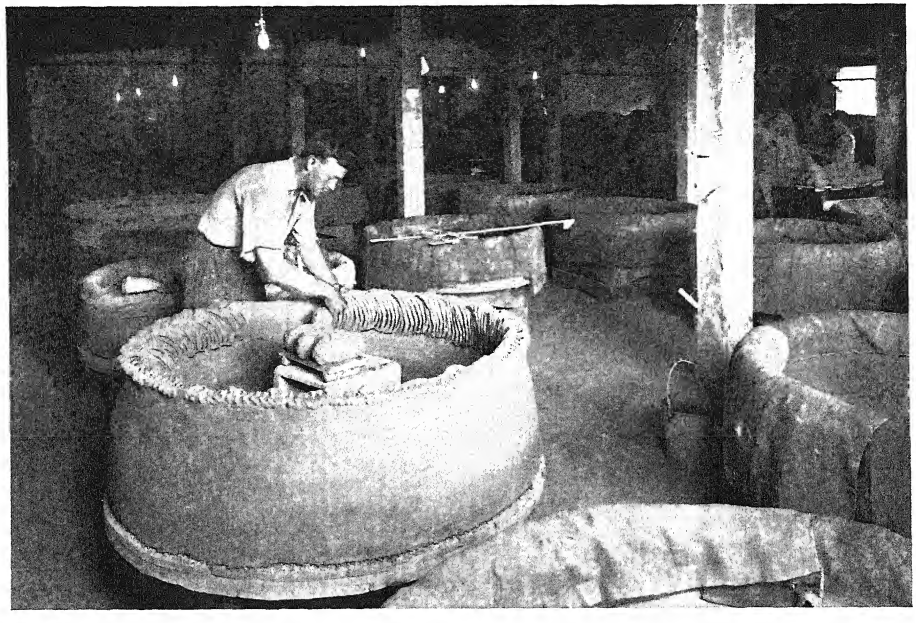
GLASSMERE · PENNSYLVANIA · USA



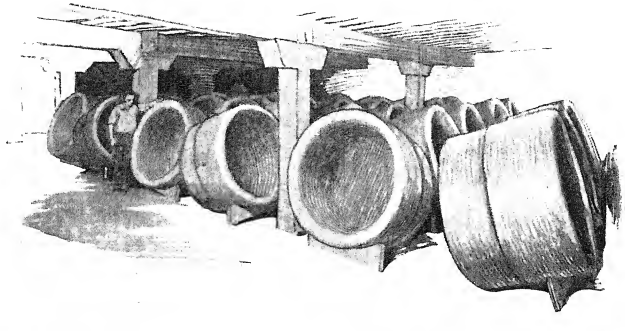
WHEREVER the use of mechanical processes is conducive to greater efficiency and the safe-guarding of quality, we have neither hesitated nor spared expense. Long continued experimenting has firmly demonstrated, however, that hand built pots of clay are the best containers for the fusion of glass metal.

THE CLAY is of the highest quality obtainable, and is shown being tamped. Tamping one batch takes sixty days, because slow and repeated working of the clay is necessary to exclude all air pockets, and to obtain the proper moisture content and consistency. Kneading layer upon layer with their bare feet, the workmen transform raw, crumbly clay into a malleable mass, suited for the molder's hand.

ALLEGHENY PLATE GLASS COMPANY



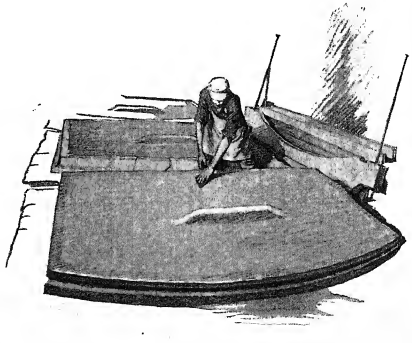
HAND-MADE pots of clay are a relic of ages long gone. But for glass making purposes, the clay pot is not equalled by any substitute, and so we find this ancient method fulfilling a useful part in modern industry. It takes fifteen days to complete one pot. The building must be gradual and careful, layer knit to layer. There must be no air holes, fault lines, nor incipient cracks. The intense heat to which they are to be subjected would soon change a slight defect into a serious leak, rendering the pot worthless and the contents wasted. But the workmen are highly skilled, and faults seldom develop.



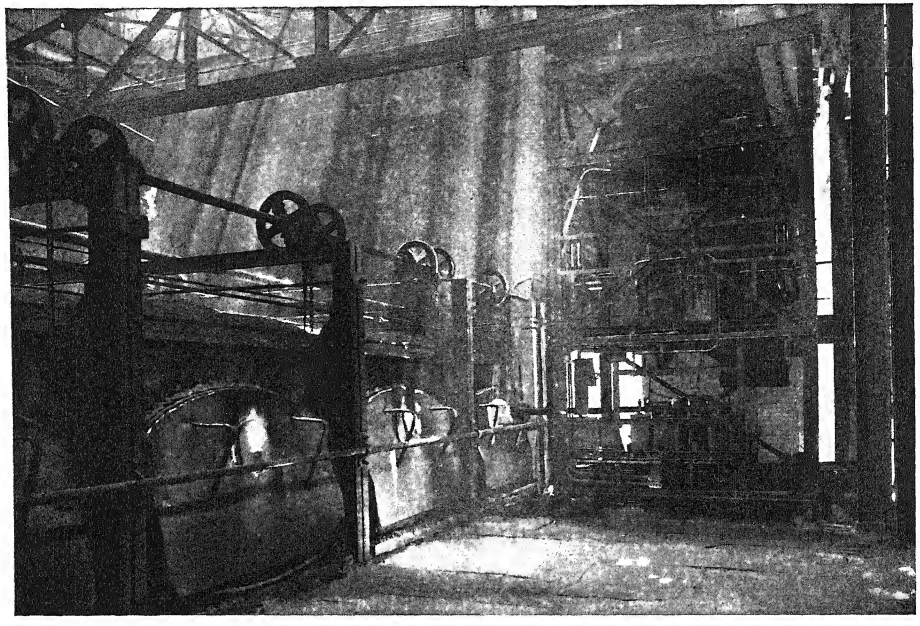
THE pots are then permitted to dry, which takes from sixty to one hundred and twenty days, depending on the season of the year and other conditions. During the first stage of drying, the pots are covered with burlap to prevent undue evaporation. This period passed, they are stored, awaiting use.

IN A similar manner the tuiles, or furnace doors, are constructed. As in the case of the pots, clay has been found to be best suited for this purpose.

IN THIS, as in everything else, we are careful about small things—on a large scale.



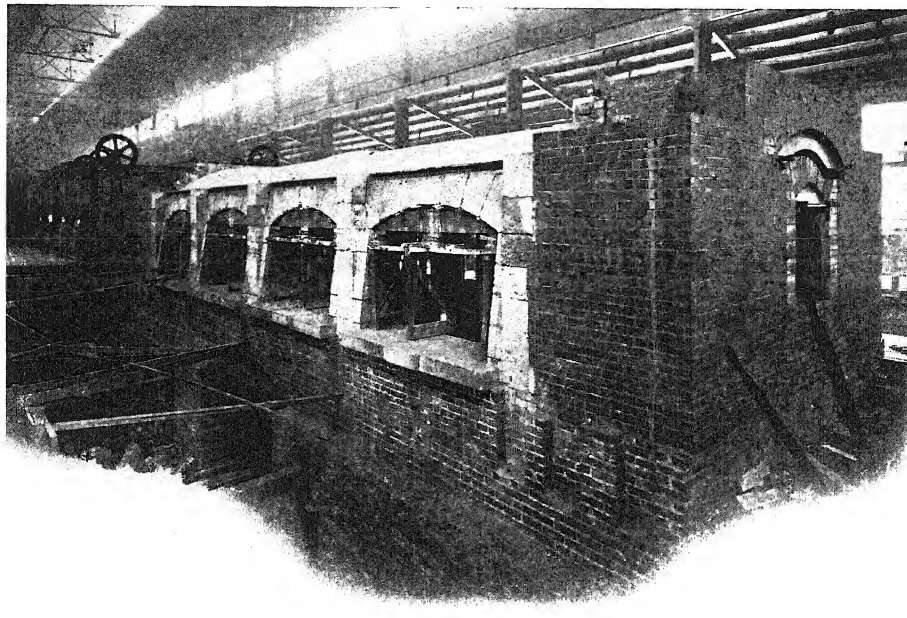
ALLEGHENY PLATE GLASS COMPANY



HERE is shown one of the melting furnaces (with its tuiles or clay doors), making a heat. At the right is the charging crane, which has received one of the conveying cars containing the mixed ingredients for glass metal. In the furnace are the empty pots to be filled by an electrically controlled arm, or dipper, on the crane. The crane moves from door to door as required, the arm entering the furnace through the small opening in the tuile.

THE charging operation is greatly facilitated by this method, which does away with most of the labor and all of the discomfort for the workmen. The furnace temperature is 2600°F.

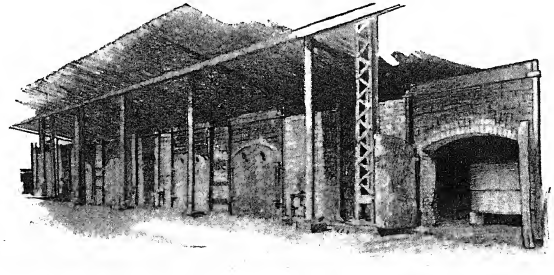
EMPTIED cars travel by return tracks to the mixer, and the process continues, uninterrupted.



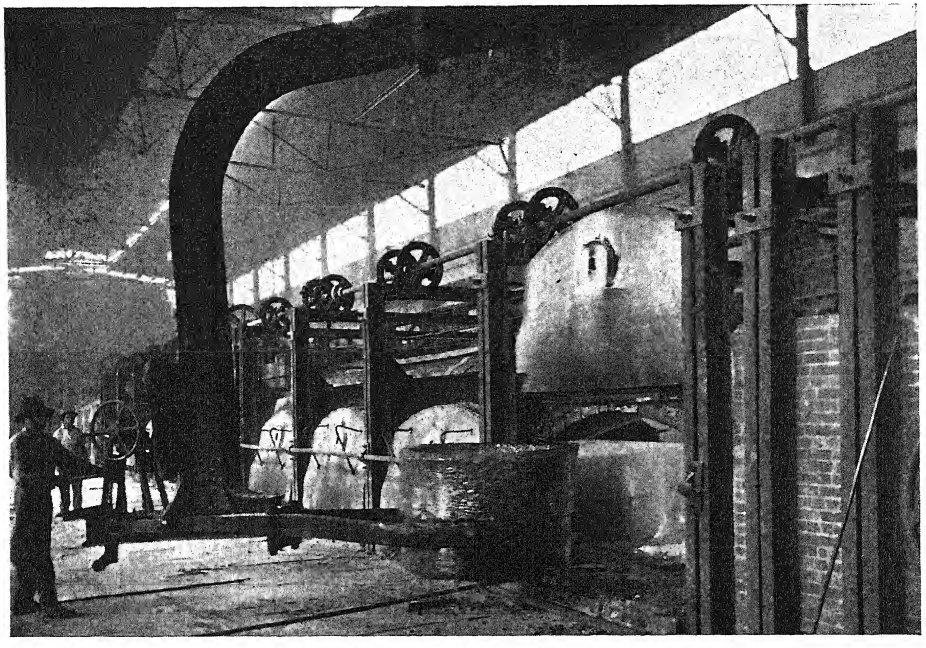
FOUR new melting furnaces are planned, one of which is shown nearing completion. Added to the six now in operation, these will give a total capacity of over forty-eight thousand square feet of rough glass a day, or about the area represented by a city square.

EACH furnace contains sixteen pots, and each pot of glass metal pours over three hundred square feet of rough plate one-half inch, standard rough thickness. This is reduced by subsequent grinding and polishing to one-fourth inch, standard finish thickness.

THUS we see that, though the area shrinking from breakage is small, due to high quality and careful methods, yet fifty percent of the raw product is consumed in obtaining that perfection of surface characteristic of the best plate glass.



ALLEGHENY PLATE GLASS COMPANY

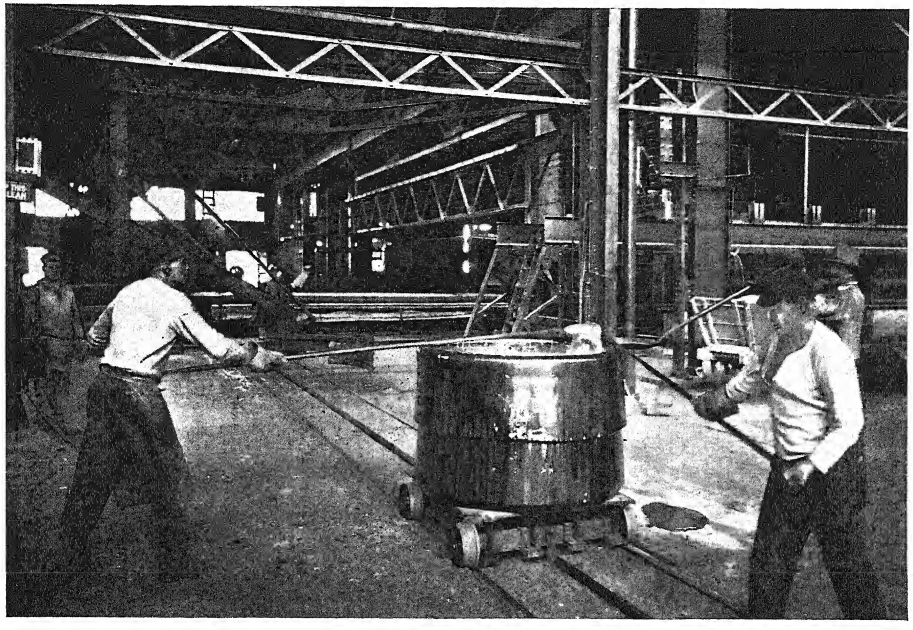


THE pot must be heat treated, preparatory to placing it in the furnace. This serves a double purpose. The first is that the heat anneals the clay, giving it its final hardness. The second, that its temperature is gradually raised, so the introduction to the melting furnace heat will not be too severe.

THIS pre-heating is accomplished in the heating arches, and should take at least two days. The increase in temperature is gradual and carefully controlled, the final heat being 1200° F. The pot is then carried directly to the melting furnace, wheeled tongs grasping the pot just below its ridge. Deposited in the furnace, it is ready to receive the charge. The pot remains in full furnace heat for sixteen hours, with an additional five hours of preparation of the metal before teeming, or pouring.

THE illustration shows the operator drawing the pot of molten glass metal with a "goose neck" crane, which conveys it to the casting department.

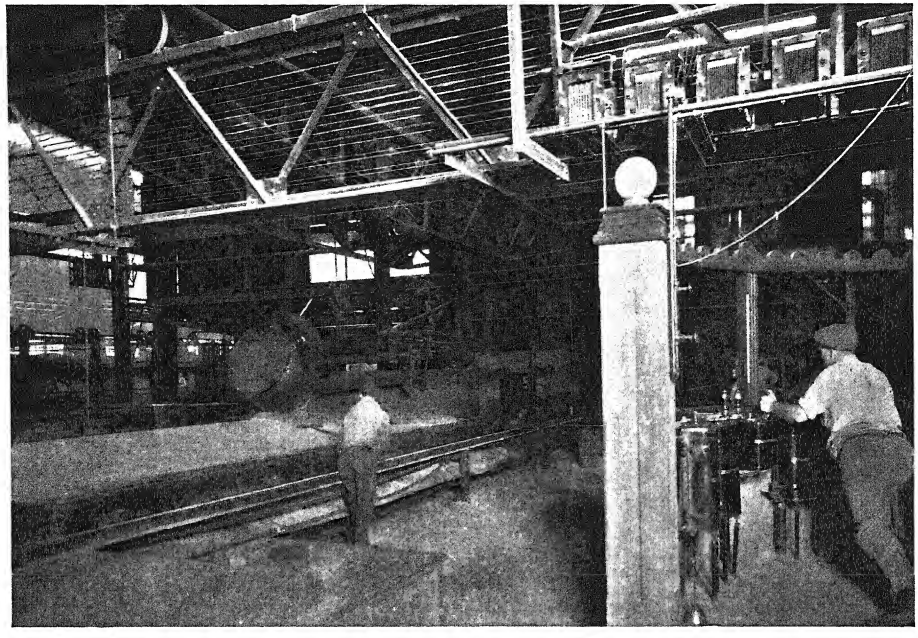
THE factory design is such that there is practically no lost motion, straight line routes being the rule. This scientific layout, combined with complete electrification of transportation makes our factory the most efficient of its kind in existence. In addition, the drudgery of old-time methods is eliminated, conserving the health and energy of our employees.



THE pot is deposited on a small cable truck by the "goose neck" crane. Here the metal is skimmed, the pot thoroughly cleaned and made ready for reception by the teeming crane in the left background.

ONE of the things about which we are very particular, and which is a potent factor in producing plate of the highest quality, is absolute cleanliness throughout the plant. We are always ready to stand inspection, and this policy is reflected in the clarity of our glass and its freedom from dirt defects.

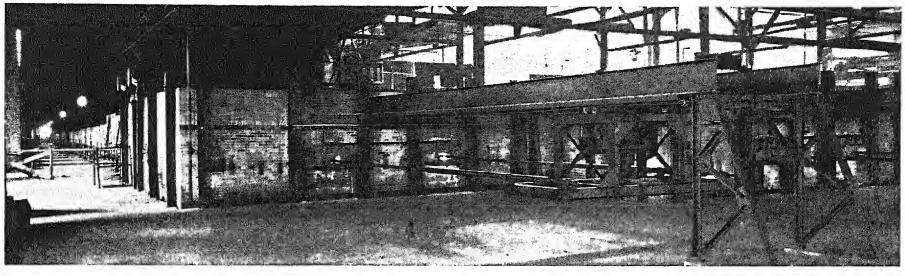
THE teeming crane lifts the cleaned pot from the small truck, and conveys the metal to the casting table on which it is poured and rolled.

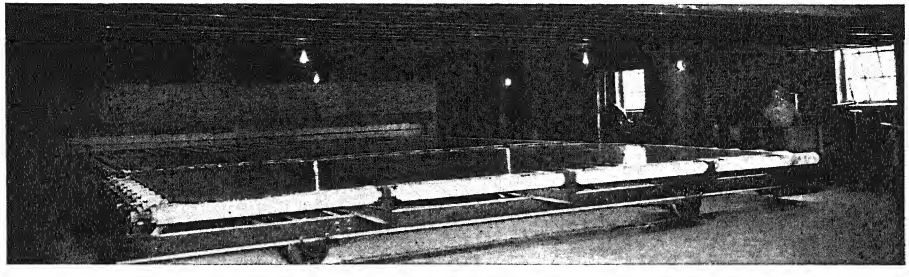


AFTER rolling, the roller lifts up off the table and the plate is automatically pushed or stowed into the first annealing oven, behind the roller. All of these steps are controlled by the operator at the right. He handles seven controls, performing nine distinct operations. The electrical installation is authoritatively said to be one of the finest in the country. The plate temperature is about 1800° F. when poured, and 1600° F. when it leaves the table. A cast is made every eight minutes.

FROM the casting and rolling table the plate is stowed into No. 1 of the five annealing lehrs. These ovens graduate downward in temperature, the plates being transferred by motor propelled stowing arms every eight minutes.

THE reducing temperatures range from 1160° F. to 900° F. at No. 5. From No. 5 the plate is stowed to the "elevator" station. Here the plate is started on a straight away journey of 365 feet through the long lehr, moving a plate width every eight minutes.



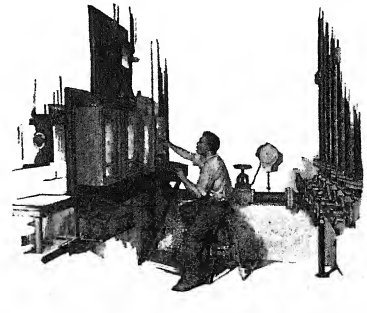


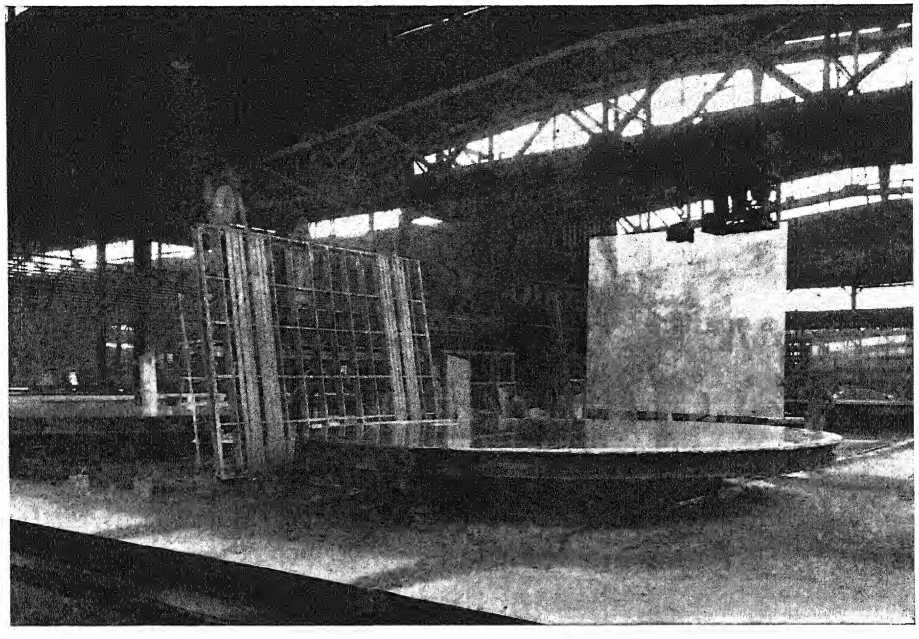
THE plate reaches the exit of the long lehr, and its temperature has been lowered to 200° F. at which the plate can be handled. The long lehr is supplied at the feed end by hot air from the annealing lehrs, and this air is drawn off at the cool end by a suction turbine.

THE plates are moved through the long lehr on rods which have an upward and forward movement above stationary rods, and a downward and backward movement beneath them. This movement carries the end plate on to an electric transfer car which conveys the plate to a cutting table. Cranes then store the rough plate against racks.

THE control of quality in every process is exemplified in the gas pressure and heat control room. The plate must be cooled quickly enough in the lehrs, so that it is properly reduced at the exit. Yet this cooling must not be too rapid, else the plate will chill and crack.

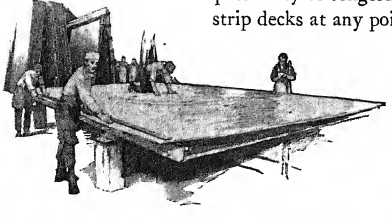
BY means of duplicating pyrometer sets, the temperature at any point is noted, and can be instantly regulated by the battery of gas valves below.

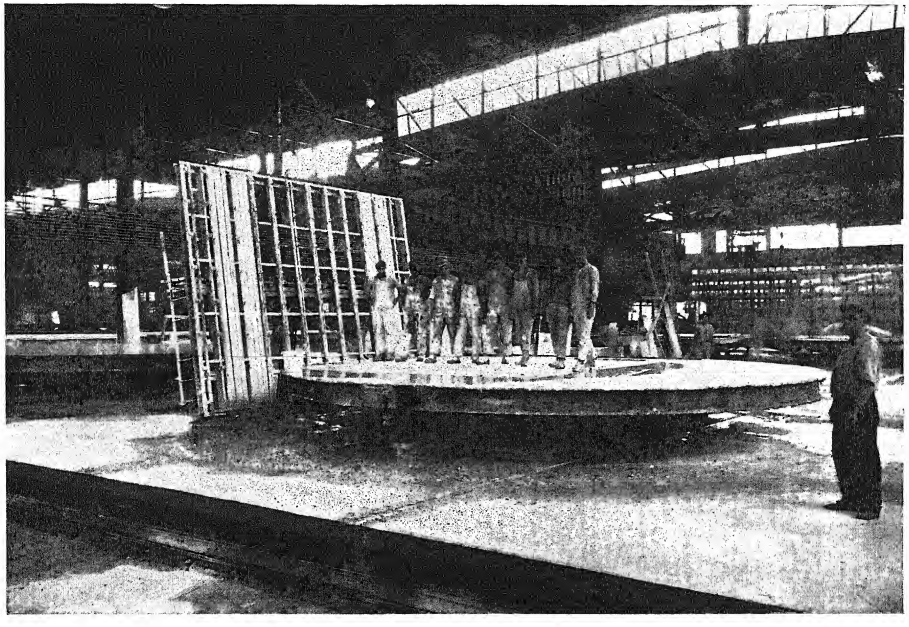




AFTER the rough plate is cut and temporarily stored in the rough racks, the next step is the grinding and polishing. This is accomplished on circular decks, or tables, to which the plate is conveyed by the crane system.

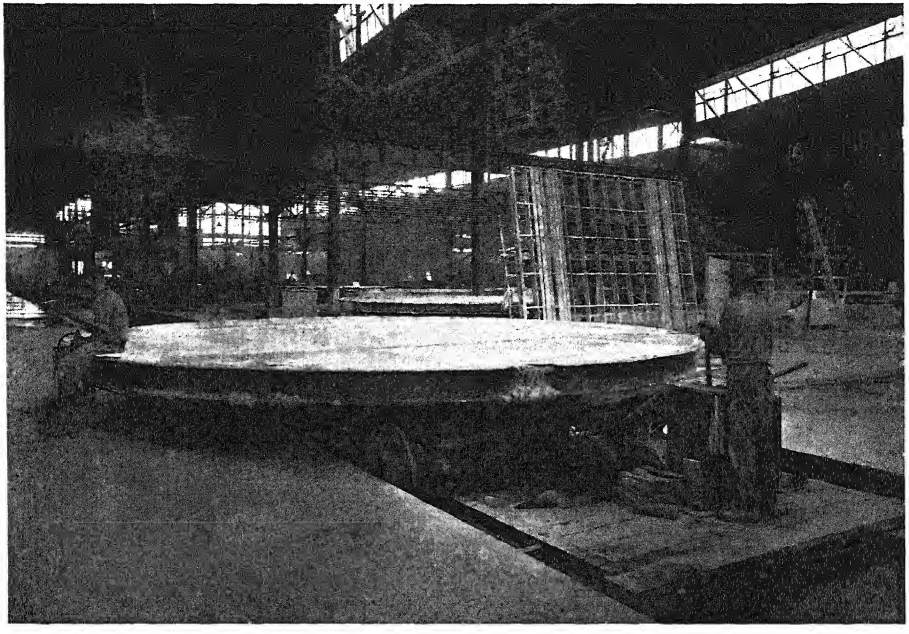
ALONG each of the two long sides of this room are the grinding and polishing machines; seven grinders on the left, seven polishers opposite. These machines are served by two electric car lines, leaving a wide strip of cross-tracked floor space for loading and stripping the decks. This floor plan removes the possibility of congestion. The free-moving cranes can lay or strip decks at any point in the room.





THE plates have been laid and matched, the surface of the deck is completely covered with glass. The joints and edges are imbedded in plaster, holding the group of plate firmly and evenly on the flat surfaced deck. It requires skillful selection of plate sizes to lay a deck with the minimum waste of space.

THEN a force of workmen mount the covered deck, and tramp back and forth over its entire surface. Their purpose is to squeeze out all excess plaster water, and to make the plate lie absolutely horizontal. The plaster sets, and the glass is ready for the first grinding.

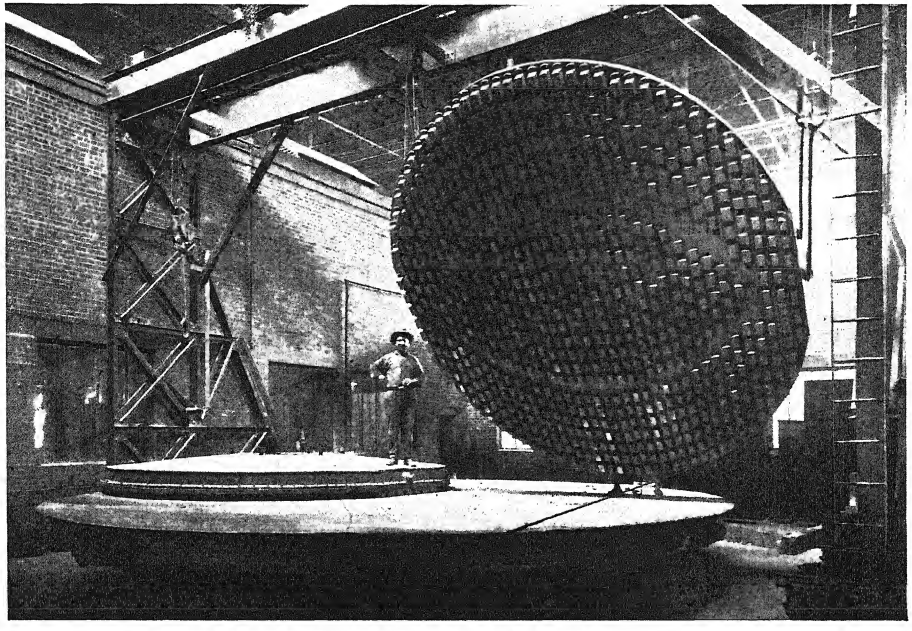


THE deck has been pulled by a power cable on the cross tracks to a transfer car which will transport it to one of the seven grinding machines available.

THE table will then be run off the car on to tracks at the left, leading directly in to the machine. The speed and ease with which these cumbersome decks are handled is striking, though in line with the general plan of efficiency and labor-saving, so evident in every step.

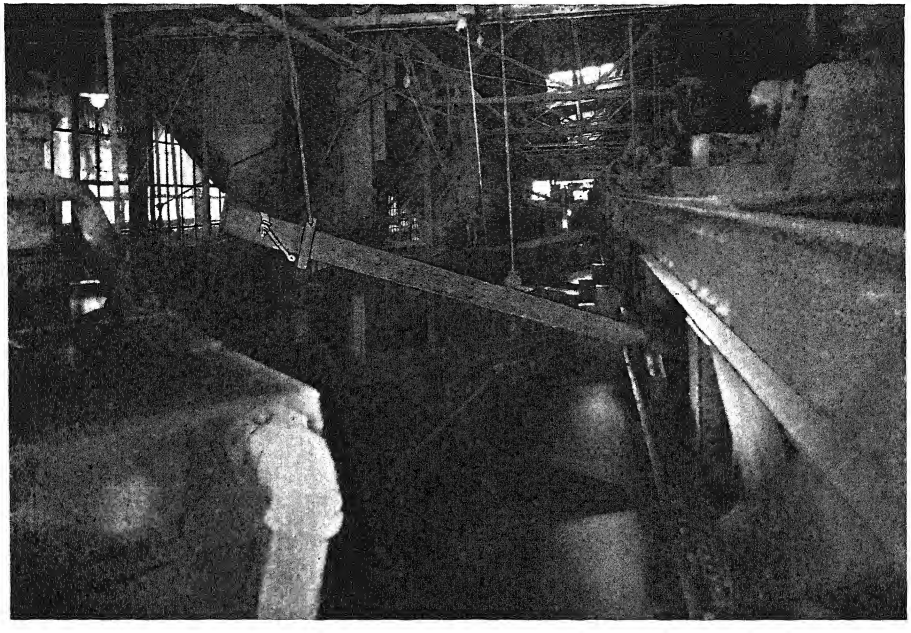
HERETOFORE, the decks were made of structural steel, but experiments have shown that cast iron gives a firmer polishing bed, and the former are being replaced as rapidly as possible.

GLASSMERE · PENNSYLVANIA · USA



HERE is shown the under surface of one of two newly completed grinding runners, which work on revolving decks. The small blocks are the iron shoes, between which the abrasives run. One of these runners weighs 8,000 pounds, making a total of 16,000 pounds grinding pressure on one deck of glass.

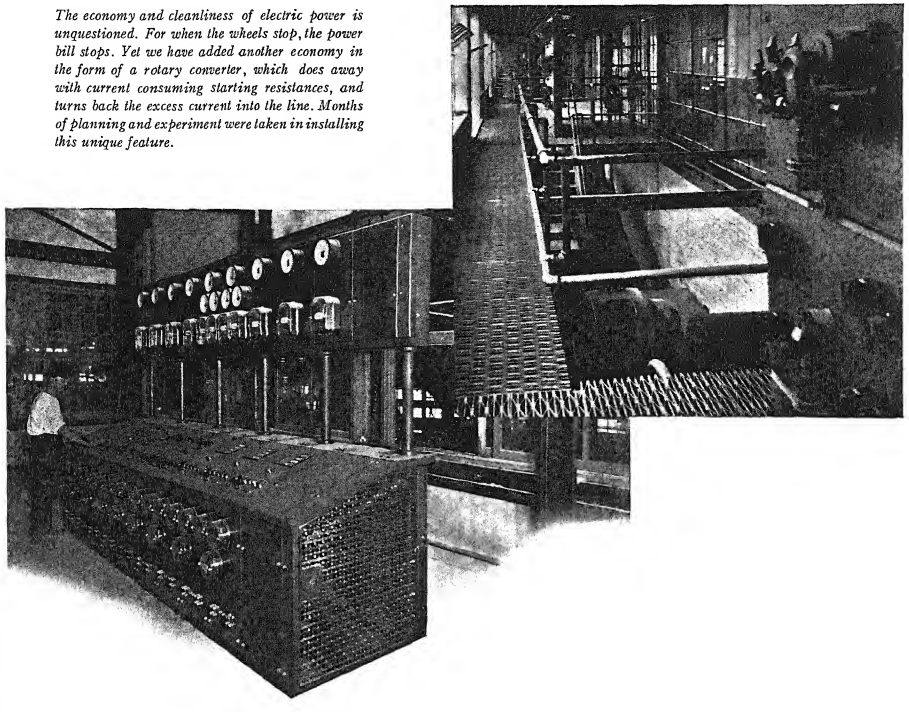
THE illustration shown above is not a grinding machine, of course, but merely the runners on their way to installation. The high safety factor and surplus power of our crane system enable us to handle easily this great bulk and weight. In the foreground is one of the circular grinding decks or tables on which the rough plate passes through the surfacing operation.



THE deck has been rolled underneath the grinders, the tracks are lowered, and the table rests on a "spider" at the top of a vertical power shaft. The "spider" and shaft whirl the deck at a speed of 22 rpm. and each grinder has its individual motor, developing 400 hp.

THE grinding runners rest entirely on the deck, and receive their motion from the friction of the latter's revolution. This operation takes about one hour to complete. Seven distinct grades of abrasive are used, from coarse sand to fine emery, drawn by the operator from overhead containers.

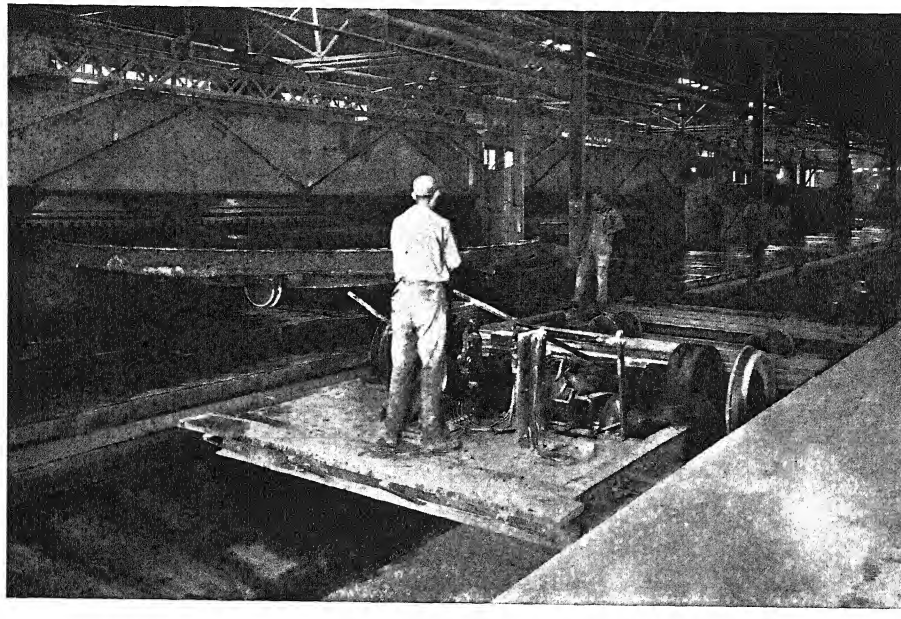
The economy and cleanliness of electric power is unquestioned. For when the wheels stop, the power bill stops. Yet we have added another economy in the form of a rotary converter, which does away with current consuming starting resistances, and turns back the excess current into the line. Months of planning and experiment were taken in installing this unique feature.



THE central power regulating station controls the starting, speed, and stopping of all of the grinder and polishing motors. The attendant of each machine flashes his requirements by electric light signals on the control board, and the central operator runs the motors accordingly.

THE operating booth is centrally located, above the general level of the machines, and is glassed in for all round observation. Meters register the power consumption, and any weakness or undue strain is instantly noted.

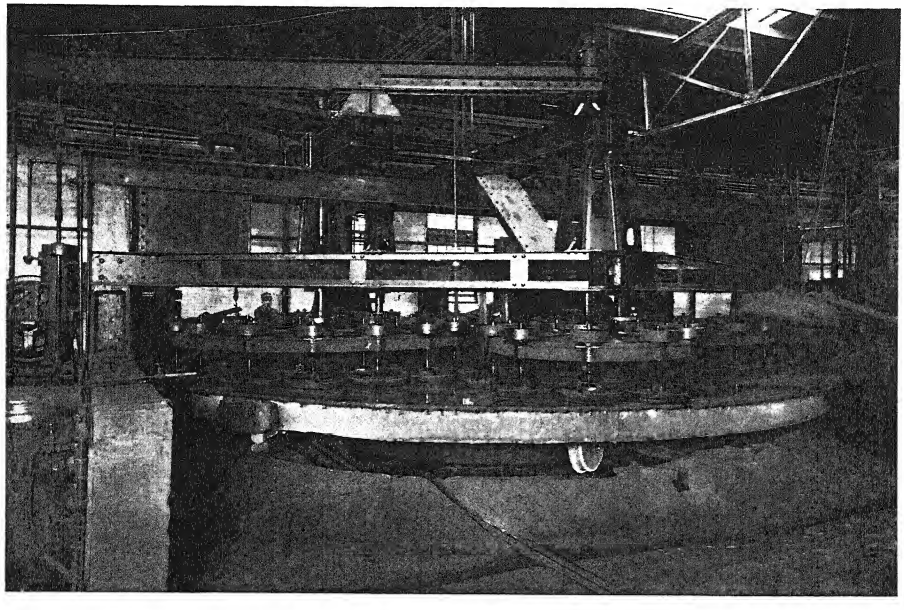
THIS clean-cut efficiency makes for operating economy, celerity, simplification, safety.



THE grinding of one side of the plate being completed, the table is rolled back on the electric car, and discharged on the jointing yard tracks. Here the glass is cleaned, and fresh plaster put in place of the original.

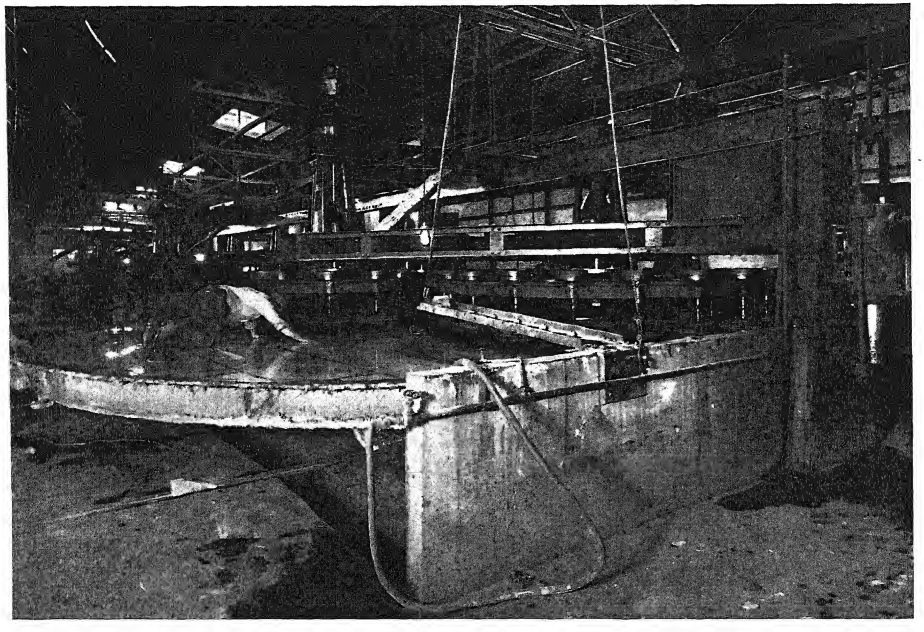
THIS precaution is to eliminate all abrasive which may have been left on the table, and is preparatory to polishing the freshly ground surface. If this were not carefully done, it is probable that the surface would be destroyed in the polishing.

THE table is then conveyed to the polishers by means of an electric car, similar to the one previously referred to, and installed in like manner.



THE polishing machine gives the final gloss to the finely ground surface. It consists of a large number of revolving felt blocks, resting on the surface of the turning deck. Liquid rouge of our own manufacture is fed to the table at the center and gives the desired finish in one hour and twenty minutes.

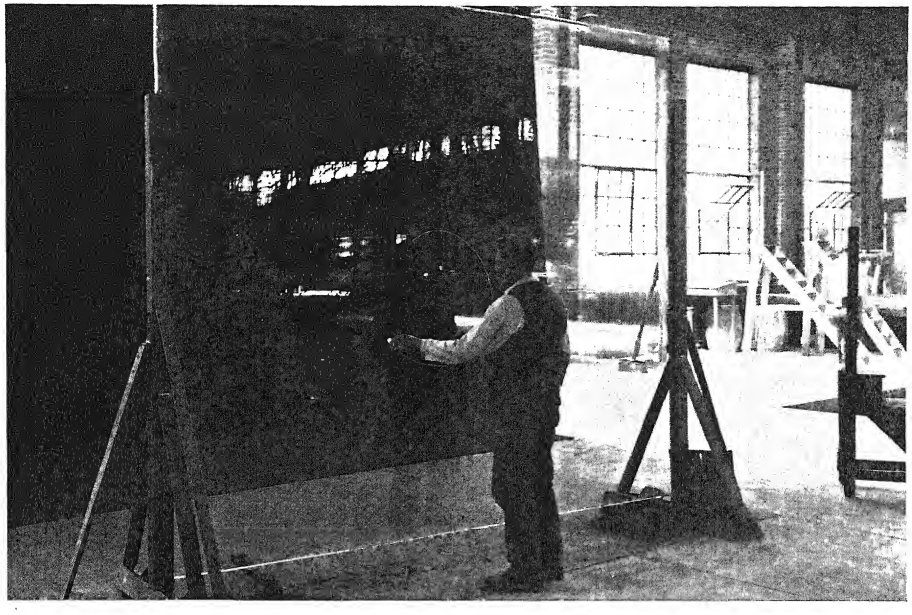
THE grinding and polishing machines are of the most modern design, with massive foundations and substantial construction, reducing vibration, surpassing all others in the quality and speed of their work. The felt blocks revolve with great rapidity, impelled by the friction of the moving glass.



INSPECTORS examine the surface thoroughly after every polishing operation. If their examination proves the finish to be satisfactory, the deck goes to the stripping yard.

THERE the plates and deck are cleaned, and the glass turned over for grinding the other surface. Then the whole process is repeated, special care being taken in laying the deck. This care is necessary to insure the second surface being exactly parallel to the first. The reverse side is then ground, cleaned, rejointed, polished and tested.

AFTER the final polishing passes muster, the deck is stripped and cleaned, and the individual plates conveyed by crane to the wash racks, where they are washed and dried.

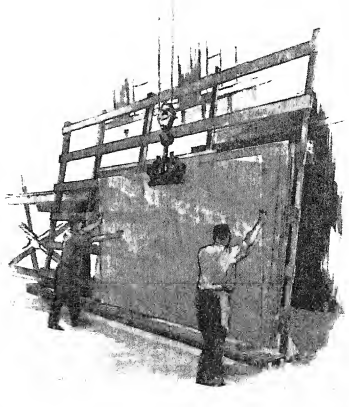


DRIED, the plates sail away in the clutch of the crane, to the inspector's set-up stand, in front of a black background. The inspector notes defects, and marks the plate for cutting, grade and destination.

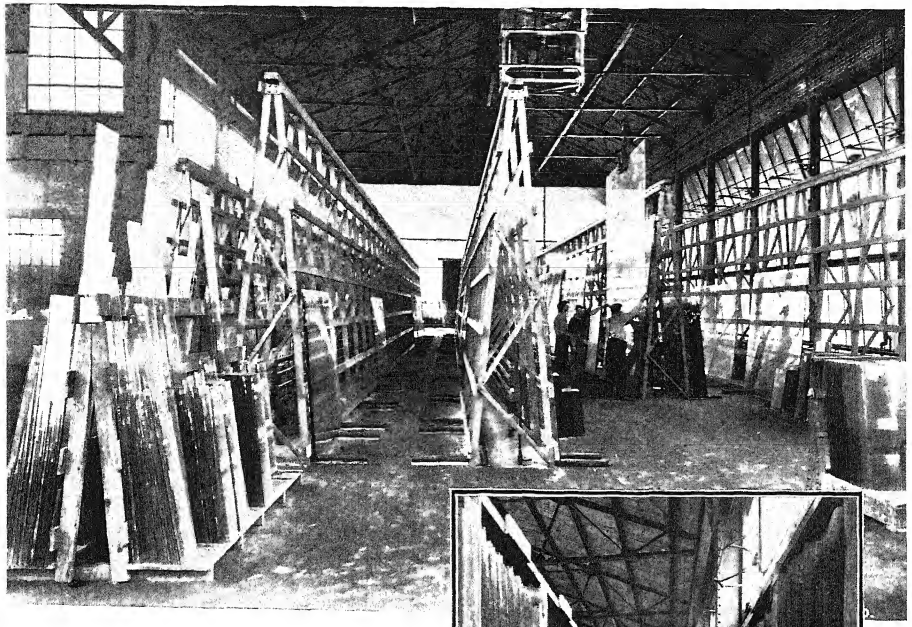
ONCE again comes the crane, lifting the plate to tables where the cutting is performed with rough diamond tools. If any imperfections are passed over by the inspector, they are caught at the cutting table and eliminated.

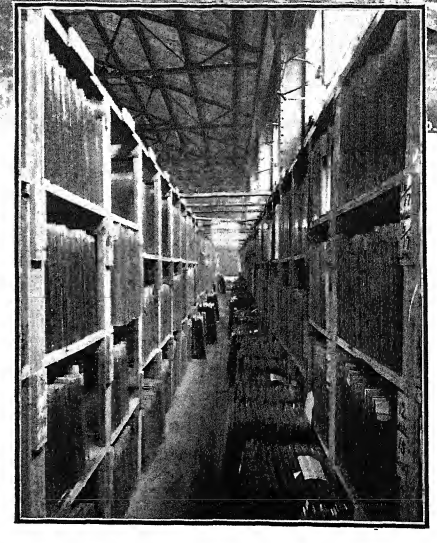
ALL of the cutting tables can be tilted hydraulically from the horizontal to the vertical and back. This places the plate on edge after cutting; the crane then grips it and takes it to the traveling racks, against which the workmen are placing the finished plate.

FROM here it is a short run to the wareroom where another crane system sorts and stores the plate, and facilitates selection, packing and loading the freight cars.



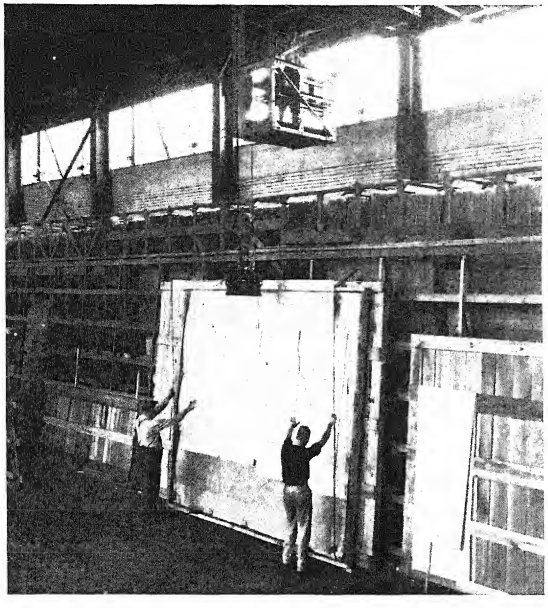
ALLEGHENY PLATE GLASS COMPANY

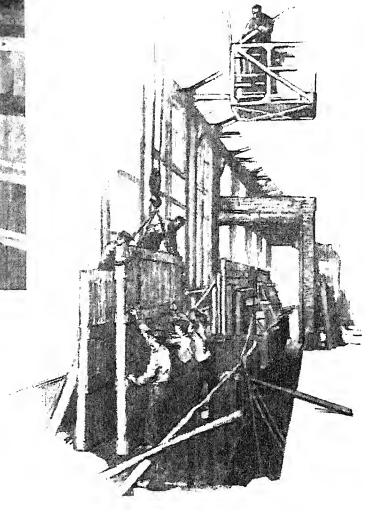




IN the wareroom, the plates are stored according to grade, size and ultimate use. Here is window plate destined for a mammoth department store. Untold thousands will gaze through it at the wares within.

At the left is a long rack for store and cabinet shelving. Then there are plate mirrors to be made, gracing fine residences, shops, or perhaps some beauty's boudoir. That piece will cover the desk of some important executive, while this pile will be the display countess in a new museum. Another sheet will possibly cover ship's compasses, braving torrid temperatures and frozen seas.





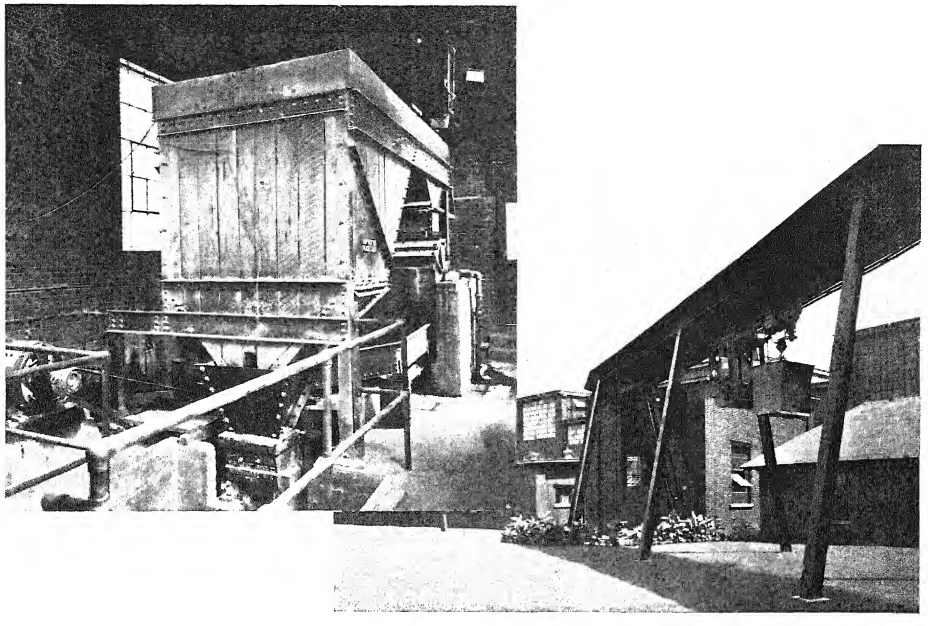
AS further evidence of the quality of our product, a large percentage of our output is used for automobile windshields and similar equipment. The requirements of this market are very exacting, due to the vibration and other severe service conditions to which such glass is subjected.

THE automobile plate is dimensioned at the cutting tables in accordance with trade standards, and stored in a special section of the spacious wareroom. The plate standing in the aisle in the small illustration on opposite page is an order for shipment.

AT the far end of the wareroom, located according to the straight line plan, are the packing room, weighing, and loading platforms. Perhaps no better example can be found than here of how electrification expedites our production. Packing plate glass for shipment was formerly a slow, laborious job, requiring the services of sixteen men. Now all the work of wrapping, padding, and boxing is performed by only three men in much less time, with the aid of an electric crane.

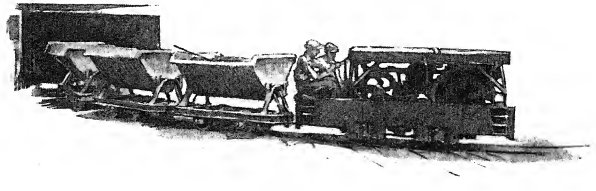
THE crane then swings the crated glass aboard the freight car, where a crew of carpenters makes all ship-shape.

ALLEGHENY PLATE GLASS COMPANY



BE as careful as we may, glass will always break from some cause or other. Then there are the odds and ends from the cutting tables. All this glass, from whatever source, is gathered at a central point near the wareroom and shipped across the inner court in an overhead monorail car, to a washer and crusher.

HERE the salvaged glass is cleaned and crushed, and finds its way back into the melting furnace. This system effects a considerable saving over a short period of time, and entirely justifies the first cost of the installation.



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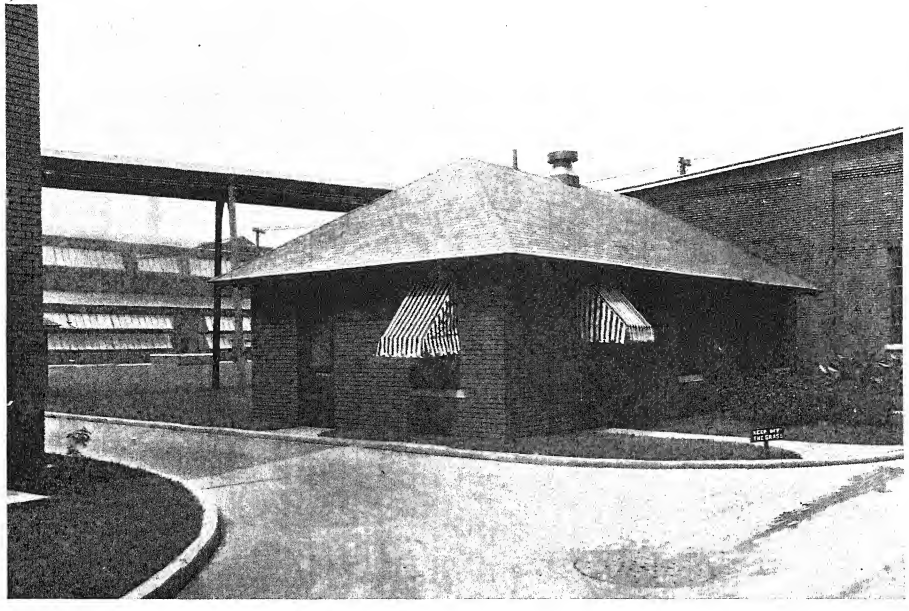
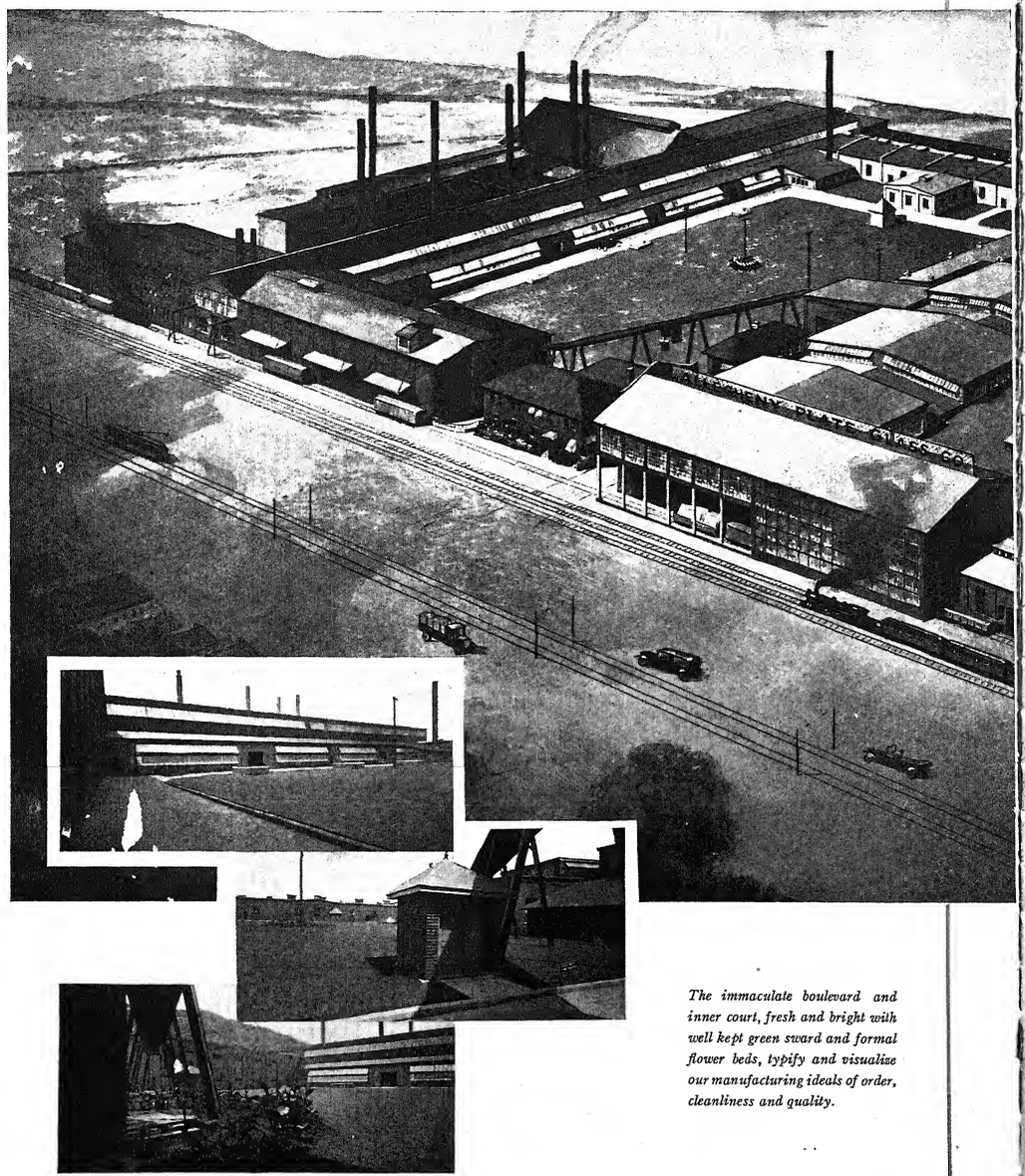


JUST as our methods of production are the best so far developed, so are the accommodations for the care of our workmen. In our welfare house, shown herewith, are a modern hospital equipment, white-clad nurses, skilled surgeons ready at any instant in case of accident.

LABOR saving machinery and our insistence upon the safety-first principle have kept our accident list small.

UP to the present, no injury has been received in our plant that could not be successfully treated in our welfare house.

ALLEGHENY PLATE GLASS COMPANY



The immaculate boulevard and inner court, fresh and bright with well kept green sward and formal flower beds, typify and visualize our manufacturing ideals of order, cleanliness and quality.

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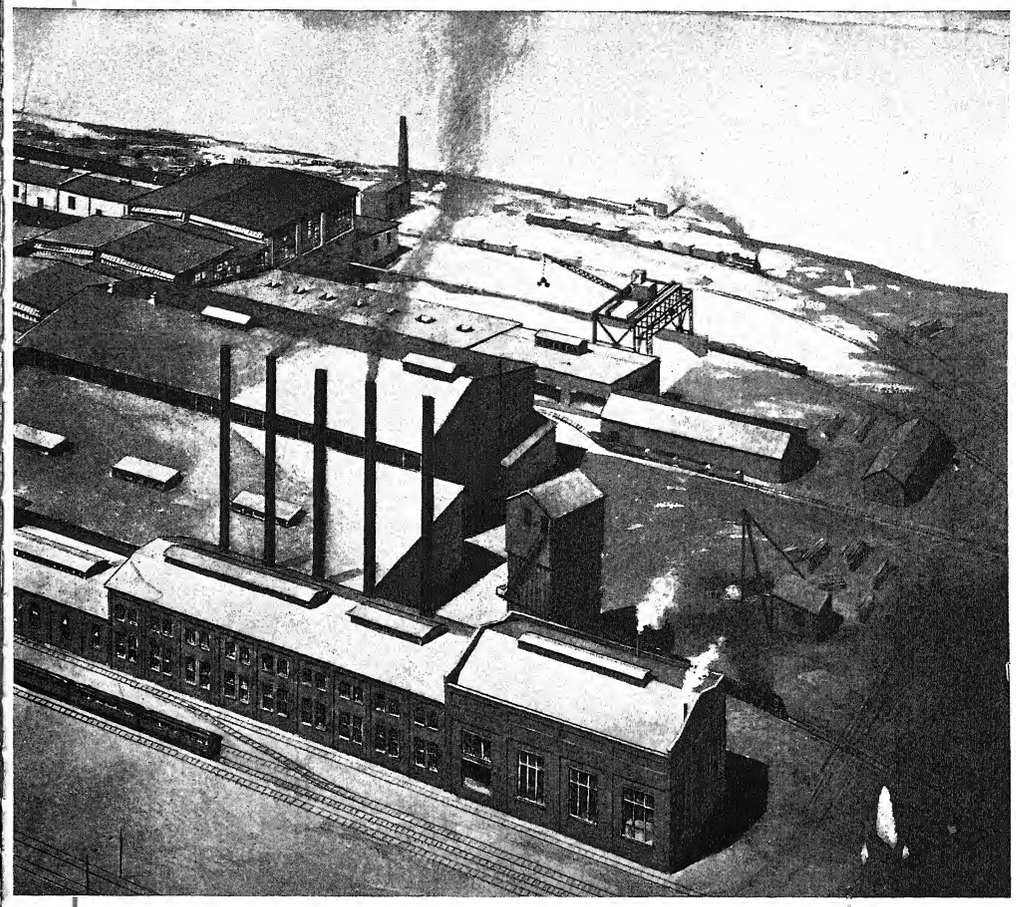

THE bird's eye view presents the plant as a whole, and gives a better idea of the natural advantages of the site than words could convey. On the one side is the Allegheny River, on the other the Pennsylvania Railroad, serving us with many spurs. Raw materials enter the storage bins at one end of the "U" which encloses the court and the finished product leaves from the end of the other leg. The many advantages of this system are evident.

ALLEGHENY PLATE GLASS COMPANY

SUCH IS THE
STORY OF ALLEGHENY PLATE GLASS
A QUALITY PRODUCT
MANUFACTURED IN A SPECIALLY
DESIGNED PLANT
WITH THE GREATEST SKILL
AND EFFICIENCY HUMAN INGENUITY
CAN DEVISE

Date Due

Feb 1 54			
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